

2016 Residential Fire Sprinklers Working Group

Working Group Report and Recommendations



Message from the State Fire Marshal

The success of CAL FIRE - Office of the State Fire Marshal is directly related to the dedication and commitment of individuals who are willing to share their time, energy, and talents to provide a fire safe environment to the citizens of California and enhance firefighter safety. This report is a continuation of the Residential Fire Sprinkler/Final Task Force Reports (Phases 1-3) that were completed between 2009 and 2010.

From January 1, 2011 to December 31, 2015 over 84,300 residential structure fires were reported to the Office of the State Fire Marshal, National Fire Incident Reporting System (as reported by 52 percent of the fire departments in the State). There were 377 civilian residential deaths, 1 firefighter fatality, and approximately \$2 billion dollars in direct dollar loss. Nationally at that the same time, there were 1,928,500 residential structure fires with 13,140 deaths, 63,810 injuries, and \$33.2 billion in direct dollar loss.

With the adoption of the 2010 California Building Standards, California became the first State in the United States to require residential fire sprinklers in all new one- and two-family dwellings and townhouse statewide. Residential fire sprinkler systems are proven to save lives and control fires. Prior to the adoption of the 2010 California Building Standards Codes, more than 150 jurisdictions in California had a local residential fire sprinkler ordinance.

The recommendations within this report are essential to ensure that the residential fire sprinkler provisions within the California Building Standards are applied consistently across the state, clarify the intent of the residential fire sprinkler requirements, and to reduce any unnecessary cost related to fire sprinkler systems. The recommendations within this report are under consideration for the 2016 Intervening Code Adoption Cycle (effective July 2018).

We at the Office of the State Fire Marshal look forward to working with each member of the Working Group on future projects. Thank you for your continued support of the Office of the State Fire Marshal.

Sincerely,

Mike Richwine
State Fire Marshal, Acting
CAL FIRE – OFFICE OF THE STATE FIRE MARSHAL

Acknowledgements

This report was developed through the culmination and outstanding collaborative efforts of the many disciplines involved with the Office of the State Fire Marshal **2016 Residential Sprinkler Working Group**.

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The Office of the State Fire Marshal thanks each member and their organizations for their assistance with this important work.

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Residential Sprinkler Working Group Scope

The scope of the project was to review and evaluate the current California Code of Regulations, Title 24 – 2013 and 2016 California Residential Code (CRC), Automatic Fire Sprinkler System provisions and to determine if revisions (amendments) are needed for the 2016 Intervening Code Adoption Cycle (effective July 1, 2018). The specific items the Working Group discussed were:

- **Garage Conversions-** The Office of the State Fire Marshal (OSFM) issued Code Interpretation 15-006 on December 3, 2015. The Working Group was asked to review the code interpretation, and provide codification of OSFM's original intent when the residential fire sprinkler requirement was adopted into the 2010 CRC.
- **Multipurpose Systems-** When water supplies serve both domestic and the fire sprinkler system, 5 gallons per minute (gpm) must be added to where the systems are interconnected. The Working Group was asked to identify where the 5 gpm should be added into the multipurpose systems' calculations.
- **Stand-Alone Pump and Tanks-** When the Residential Fire Sprinkler Installation Task Force finalized the Phase II report in 2009, the committee amended the 2010 CRC to require tanks and pumps to serve both domestic and fire sprinkler systems. This Working Group evaluated the existing state amendment to see if a stand-alone tank and pump can be used to supply only the fire sprinkler systems.

Recommendations

Garage Conversions

The OSFM received a code interpretation request to clarify if the exception to Section R313.2 of the CRC only applies to existing one- and two-family dwellings on the property or if it extends to alternations/additions of other detached structures anywhere on the property. The section reads as follows:

R313.2 One- and two-family dwellings automatic fire systems. An automatic residential fire sprinkler system shall be installed in one- and two-family dwellings.

Exception: An automatic residential fire sprinkler system shall not be required for additions or alterations to existing buildings that are not already provided with an automatic residential sprinkler system.

The OSFM response to the question is Code Interpretation 15-006. Code Interpretation 15-006 can be found in Appendix A.

The OSFM originally adopted the automatic fire system requirements for one- and two-family dwellings during the 2009 Triennial Code Adoption Cycle. When CRC Section R313.2 was originally adopted by the CBSC, it was the intent of the exception to apply to existing one- and two-family dwelling buildings located on the property undergoing an addition or alteration. The OSFM never intended for the exception to apply to other detached structures located on the property (i.e. detached garage) being converted into a new dwelling unit that is detached from the existing dwelling unit on the property.

Detached garages and accessory structures (typically Group U Occupancies) are not considered a one- or two-family dwelling (Group R-3 Occupancy) and therefore they must comply with the California Building Code (CBC). When a change in use (occupancy) occurs, CRC Section R110.2 requires the change to comply with Sections 3408 and 3409 of the CBC. CBC Section 3408 states "No change shall be made in the use or occupancy of any building... unless such structure is made to comply with the requirements of this code." Therefore, when detached garages or accessory structures are converted to a one- or two-family dwelling, it is considered a change of occupancy and shall comply with the current codes. Therefore, residential fire sprinklers would be required in all detached garages and accessory structures converted to a dwelling.

The Working Group reviewed OSFM Code Interpretation 15-006 and agreed with the interpretation. The Working Group confirmed the OSFM's response of any change in use or occupancy of an existing detached garage or accessory structure would require residential fire sprinklers.

Related to the Application of CRC Section R110.2 Questions

Question 1: Would residential fire sprinklers be required if a one-family dwelling was being converted to a two family dwelling?

Answer 1: No. Converting a one-family dwelling to a two-family dwelling is not a change in occupancy. If the original dwelling does not have a residential fire sprinkler system, fire sprinklers would not be required in the structure.

Question 2: There is an existing one-family dwelling. A second dwelling will be added, and there will be a common wall between the existing dwelling

and the new dwelling. The combined structure is now a two family dwelling. Are residential fire sprinklers required in the new dwelling?

Answer 2: No. The new dwelling is considered an addition to the original one-family dwelling. A Residential fire sprinkler system would not be required in either structure.

Question 3: A new detached single family dwelling is being constructed on the property. There are no common walls, and there is a sidewalk between the existing dwelling and the new dwelling. There are trusses connecting the building. Are residential fire sprinkler required in the new dwelling?

Answer 3: The requirements of CRC R110.2 would depend on how the local enforcing agency is classifying the new single family dwelling. If the enforcing agency is classifying it as a new dwelling, then residential fire sprinklers are required. If the enforcing agency is considering the new dwelling an addition to the original single family dwelling, then no residential sprinklers would be required.

The OSFM does not intend to hinder the ability of the local enforcing agency determinations when classifying the building. Additionally, many jurisdictions have implemented local ordinances in which the OSFM has no authority to interpret or modify. However, the OSFM may provide guidance in the implementation and enforcement of the residential fire sprinkler provisions contained in the CRC and the referenced national standard.

Multipurpose Residential Fire Sprinkler Systems

Multipurpose residential fire sprinkler systems are being installed across the State. The 2013 edition of NFPA 13D, *Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes*, defines a *Multipurpose Piping Sprinkler System* as “a piping system intended to serve both domestic needs in excess of a single fixture and fire protection needs from one common piping system throughout the dwelling unit(s).” In multipurpose sprinkler system the sprinkler system and plumbing system are supplied from a common cold water distribution system.

When performing hydraulic calculations of residential fire sprinkler systems, Section R313.3.5 of the CRC requires 5 gpm to be added to where the systems are interconnected. There has been confusion among the licensed design professionals and enforcing agencies on where the 5 gpm should be added on multipurpose systems’ calculations.

During the Phase 2 Working Group in 2009, a survey was conducted of jurisdictions with a residential sprinkler ordinance to see if they required a safety factor to be added into the calculations beyond the 5 gpm. The results of the survey showed local ordinances required an additional 5-25 gpm safety factor. The Phase 2 Working Group agreed on a 5 gpm safety factor to ensure that if a plumbing fixture was being used, diminishing water supply would not impact the residential fire sprinkler required water.

After evaluating the original intent of the amendment to CRC Section R313.3.5, the current Working Group determined 2.5 gpm should be added to each of the two remote plumbing fixtures on multipurpose systems. This requirement would match the original intent of the 5 gpm for standalone sprinkler systems that share a water supply. Figure 1 shows an illustration of a multipurpose system. It shows the two sprinklers used in the calculations and the two locations where 2.5 gpm are being added to the plumbing fixtures.

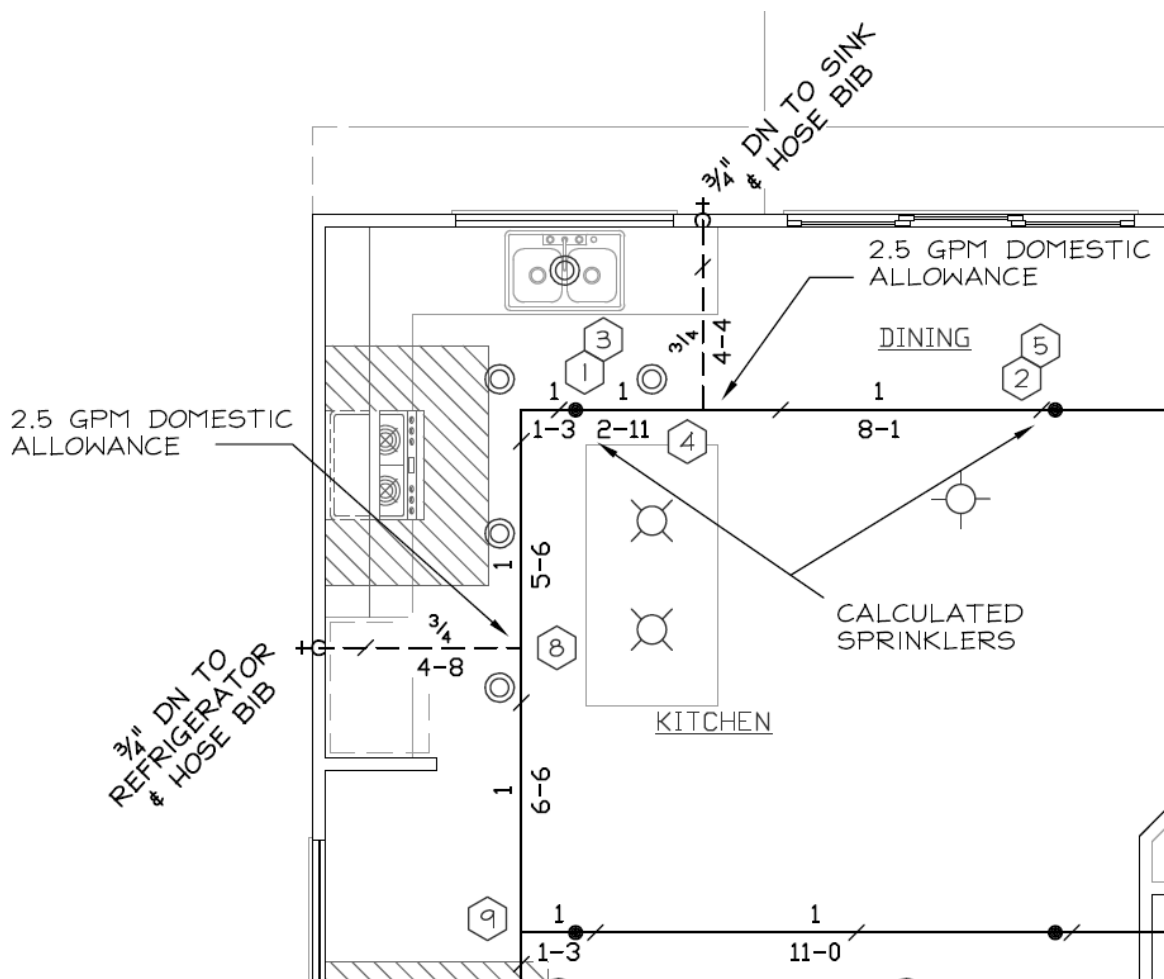


Figure 1- Multipurpose System 2.5 gpm example.

The Working Group is recommending two code changes for the intervening code cycle to codify this arrangement.

Proposed Code Changes to the 2016 California Residential Code

[The new text is underlined.]

R313.3.5 Water supply. The water supply shall provide not less than the required design flow rate for sprinklers in accordance with Section R313.3.4.2 at a pressure not less than that used to comply with Section R313.3.6. *Where a water supply serves both domestic and fire sprinkler systems, 5 gpm (19 L/min) shall be added to the sprinkler system demand at the point where the systems are connected, to determine the size of common piping and the size of the total water supply requirements where no provision is made to prevent flow into the domestic water system upon operation of a sprinkler. For multipurpose piping systems, the 5 gpm (19 L/min) demand shall be added at the domestic connection nearest the design area. This demand may be split between two domestic connections at 2.5 gpm (10 L/min) each.*

Proposed Code Changes to NFPA 13D, 2016 Edition

This proposed code change would be reflected in the California Building Code (Chapter 35), California Residential Code (Chapter 44), and California Fire Code (Chapter 80), relating to the referenced standard NFPA 13D, 2016 Edition.

6.2.4 *Where a water supply serves both domestic and fire sprinkler systems, 5 gpm (19 L/min) shall be added to the sprinkler system demand at the point where the systems are connected, to determine the size of common piping and the size of the total water supply requirements where no provision is made to prevent flow into the domestic water system upon operation of a sprinkler. For multipurpose piping systems, the 5 gpm (19 L/min) demand shall be added at the domestic connection nearest the design area. This demand may be split between two domestic connections at 2.5 gpm (10 L/min) each.*

Stand-alone Pump and Tanks

NFPA 13D and the International Residential Code (model code for California Residential Code) allows stand-alone pump and water storage tanks. The Residential Fire Sprinkler Installation Task Force finalized the Phase II report in 2009. The Task Force amended the CRC to require tanks and pumps to serve both domestic and fire sprinkler systems. The justification for this amendment was as follows:

“It was determined that where homes are supplied by a well, pump, tank or combination of those components, the water reliability of the water supply is best underwritten by requiring that both domestic and fire systems be supplied by the same source. This finding was based on empirical and anecdotal evidence obtained through on-line surveys of fire sprinkler industry and fire service members and from within the task force. Several respondents from the fire service, particularly in the Eastern United States where booster pumps are more commonly required because of low working pressures in water mains, had personally experienced non-functioning fire sprinkler water supplies due to failed testing and maintenance. This was also the experience of contractor members of the sub-group in California.”

Note: Pressurized tanks are allowed, but are covered by NFPA 13D in other sections of the standard. Pressurized tanks should be approved by the local enforcing agency.

The Working Group evaluated the need to have stand-alone tank and pumps that only supply the residential fire sprinkler system. These systems would commonly be used where residential sprinklers are being added to existing buildings (detached garage conversions), when water supplies can supply the domestic water demand but not fire sprinkler demand, and areas where the cost to provide an upgraded water meter for fire sprinklers was cost prohibitive.



Figure 2- Pump and Tank for NFPA 13D Systems

Stand-alone pump and tank packages are an option when connecting to a local water purveyor is cost prohibitive or the city water does not supply the required demand for the sprinkler system. The Working Group examined the existing state amendment and determined, with a set of conditions, that a stand-alone tank and pump can be used to supply residential fire sprinkler systems only.

The following conditions are needed to overcome the 2009 Phase II Task Force concerns:

- *The pump shall be connected to a circuit breaker shared with a common 220 volt house hold appliance (E.g. range, oven, dryer).* When a pump controls both domestic and fire sprinkler systems the occupant will ensure that the pump is on and functioning. Within a standalone pump, there is potential to the pump to be turned off and not function in a fire situation. The Working Group felt that by requiring the pump to be connected to another major appliance, that the pump would not be accidentally or intentionally turned off at the electrical panel.
- *The pump shall be a stainless steel 240 volt pump.* There was concern with the 2009 Phase II Task Force that the pump may not be used for a number of years. When a fire event did occur, there was potential for the pump to be seized. The current Working Group felt that a stainless steel 240 volt pump would be able to overcome not being used for several years.
- *A valve shall be provided to exercise the pump. The discharge of the exercise valve shall be piped to the tank. A sign shall be provided stating "Valve must be opened monthly for 5 minutes."* As with the item above, the current Working Group felt that there needed to be a way to exercise the pump. The Working Group felt a valve should be provided that discharges directly back into the tank to allow the occupant to easily exercise the pump. It was also felt that a sign should be provided for the occupant to know the frequency and the duration needed to properly exercise the pump.
- *A means for automatically refilling the tank level, so that the tank capacity will meet the required water supply duration in minutes shall be provided. Backflow, where required, shall be provided by an airgap or other approved methods.* Absent of a regulatory mandate for the inspection, testing, and maintenance to be performed on residential fire sprinkler systems, an automatic refill mechanism will help to ensure an adequate water supply.

The Working Group felt that the bullet points above would mitigate noted concerns and potential risk from the 2009 Phase II Task Force. Occupants

will need to be responsible for the maintenance, as they are with the maintenance of smoke and carbon monoxide alarms.

The Working Group is proposing two code changes to the California Codes in the next code cycle to clarify the use of stand-alone tank and pump.

Proposed Code Changes to the California Residential Code

R313.3.5.2 Required capacity. The water supply shall have the capacity to provide the required design flow rate for sprinklers for a period of time as follows:

1. 7 minutes for dwelling units one story in height and less than 2,000 square feet (186 m²) in area. *For the purpose of determining the area of the dwelling unit, the area of attached garages and attached open carports, porches, balconies and patios shall not be included.*
2. 10 minutes for dwelling units two or more stories in height or equal to or greater than 2,000 square feet (186 m²) in area. *For the purpose of determining the area of the dwelling unit, the area of attached garages and attached open carports, porches, balconies, and patios shall not be included.*

R313.3.5.2.1 Where a well system, a water supply tank system, a pump, or a combination thereof, is used, the configuration for the system shall be one of the following:

1. ~~The~~ water supply shall serve both domestic and fire sprinkler systems. Any combination of well capacity and tank storage shall be permitted to meet the capacity requirement.

2. A stand-alone tank is permitted if the following conditions are met:

2.1 The pump shall be connected to a 220 volt circuit breaker shared with a common house hold appliance (E.g. range, oven, dryer),

2.2 The pump shall be a stainless steel 240 volt pump,

2.3 A valve shall be provided to exercise the pump. The discharge of the exercise valve shall be piped to the tank, and

2.4 A sign shall be provided stating "Valve must be opened monthly for 5 minutes."

2.5 A means for automatically refilling the tank level, so that the tank capacity will meet the required water supply duration in minutes shall be provided.

Proposed Code Changes to NFPA 13D, 2016 Edition

The following proposed code change would be reflected in the California Building Code (Chapter 35), California Residential Code (Chapter 44), and

California Fire Code (Chapter 80), relating to the referenced standard NFPA 13D, 2016 Edition.

6.2.2 Where a well, pump, tank or combination thereof is the source of supply for a fire sprinkler system, the configuration for the system shall be one of the following:

~~(1) the~~The water supply shall serve both domestic and fire sprinkler systems, and the following shall be met

~~(1a)~~ A test connection shall be provided downstream of the pump that creates a flow of water equal to the smallest sprinkler on the system. The connection shall return water to the tank.

~~(2b)~~ Any disconnecting means for the pump shall be approved.

~~(3c)~~ A method for refilling the tank shall be piped to the tank.

~~(4d)~~ A method of seeing the water level in the tank shall be provided without having to open the tank.

~~(5e)~~ The pump shall not be permitted to sit directly on the floor.

2. A stand-alone tank is permitted if the following conditions are met:

(a) The pump shall be connected to a 220 volt circuit breaker shared with a common house hold appliance (E.g. range, oven, dryer),

(b) The pump shall be a stainless steel 240 volt pump,

(c) A valve shall be provided to exercise the pump. The discharge of the exercise valve shall drain to the tank, and

(d) A sign shall be provided stating "Valve must be opened monthly for 5 minutes."

(e) A means for automatically refilling the tank level, so that the tank capacity will meet the required water supply duration in minutes shall be provided.

(f) A test connection shall be provided downstream of the pump that creates a flow of water equal to the smallest sprinkler on the system. The connection shall return water to the tank.

(g) Any disconnecting means for the pump shall be approved.

(h) A method for refilling the tank shall be piped to the tank.

(i) A method of seeing the water level in the tank shall be provided without having to open the tank.

(j) The pump shall not be permitted to sit directly on the floor.

Local Amendments

The Working Group wanted to stress that NFPA 13D systems should follow the state requirements, without local amendments. The California Fire

Sprinkler Coalition published a white paper in June 2014. The following section is a reprinted from the of *Local Add-ons Are Unnecessary* section.

Local Add-ons Are Unnecessary

[Reprinted with the permission from the California Fire Sprinkler Coalition.] NFPA 13D was developed to provide a cost effective means to provide occupants ten minutes to evacuate a home safely. It was not designed to protect against an external fire threat, nor was it designed to confine or suppress fires beyond that needed to allow for timely occupant evacuation.

The attributes of a fire sprinkler system must fit the fire threat. Changing design or installation requirements for perceived added benefit could be disastrous. What may appear to be minor amendments to the sprinkler system design and installation standard can have a significant effect on the proper operation during a fire incident. In fact, there is often no benefit to show for the further amendment.

If all jurisdictions changed the requirements in one way or another, there would be no consistency in the provisions across the State. Not only can local amendments adversely impact those who install fire sprinklers by creating confusion, but it can also negatively affect the building industry by unnecessarily increasing construction costs. Local amendment “patchwork” of the standard ultimately jeopardizes the State’s ability to require fire sprinklers in newly constructed homes due to complaints of inconsistent regulations.

Note the following recommendation from the California Task Force: “The fewer local amendments the better. Those that are absolutely necessary should be based upon specific local conditions relative to climatic, topographical, geological or resource constraints (access and water supply always being a consideration).”

Regarding local amendments this California Task Force recommendation suggested the following: “Coordinate requirements with surrounding jurisdictions. Consistency statewide will be very difficult to achieve but even on a countywide level it will be extremely helpful to developers and contractors.”

The report also states, “Unique jurisdictional sprinkler ordinances defeat the cost savings intended by the drawing of standardized plans, since the plans have to be revised to a varying degree for each unique ordinance.”

Examples of local add-on requirements introduced during the local adoption that provide little or no benefit, cause confusion, change the intent of the design and installation standard, and jeopardize the statewide residential sprinkler requirement include the following:

Attic Sprinklers: Adding a requirement to provide sprinkler protection in an attic space raises questions that are not clearly answered. Is this really necessary for life safety, which is the intent of NFPA 13D? What type of sprinkler should be installed in an attic, and how is the system demand calculated, with the two sprinkler design? These issues are not addressed in the standard.

Small Area Coverage: Going “above and beyond” the standard and requiring small areas like closets and bathrooms, which are omitted in the standard, does not seem to provide much benefit for the added cost. Such add-on’s may add to the calculated demand, and increase system requirements for supply lines and meter sizing. Statistics indicate that few fires occur in these areas and installing sprinklers does not significantly increase occupant safety.

Increased Calculation Requirements: Increasing the calculation requirement to four sprinklers, as opposed to the required two, increases the water supply sizing requirements significantly. This will likely lead to larger pipe sizes and meter sizes and significantly increases the costs of the systems and potentially any monthly service fee.

Exterior Bell: Requiring a water flow detection device, such as a bell, can significantly impact the type of sprinkler system designed. Such requirements virtually eliminate the possibility of a multipurpose or a “passive purge” system, which may mean giving up an alternative method that often eliminates consideration of back flow devices.

Backflow Device: Requiring a backflow device will add significant friction loss to the pressure loss calculation and increase the sizing of components and thus the cost of the sprinkler system. Such an add-on may be completely unnecessary given the extremely low adverse risk of backflow for sprinkler systems, especially those that are integral with the potable water supply in the home. In general, a clear hazard class should exist for backflow devices to be required, something fairly rare in a typical home on a public water system.

Minimum Meter Size: The design of the system should dictate the size of the water meter. Specifying a minimum meter size without clear

hydraulic calculations using water system operating pressure considerations can unnecessarily increase the size of the house service lateral pipe and more importantly the water meter, if a water meter is required. This not only increases the cost associated with the system, but it can increase the costs to the home owner where the water purveyor charges monthly meter service fees.

Separate Water Tap: Requiring a separate water tap to the water main solely for a sprinkler system increases the cost for the installation and likely the monthly service fee as well. This also limits design options for the type of sprinkler utilized, preventing the use of multipurpose systems, which in many cases will be less expensive.

The NFPA 13D standard is specifically for sprinklers installed in one- and two-family dwellings and townhouses. It was developed to encourage the use of fire sprinklers in homes. This was accomplished by reducing the requirements – and the cost – of an NFPA 13 compliant automatic fire sprinkler system. The goal was to provide the greatest life safety for occupants of residential dwellings at the lowest possible cost. Doing so reduced the complete property protection aspect of the NFPA 13 standard.

An NFPA 13D system provides life safety of the occupants in a home to allow for self-rescue. The purpose is neither to protect property nor to aid in firefighting, although statistics indicate an excellent record of doing both as an unintended consequence.

The reductions to the NFPA 13 compliant standard that create the NFPA 13D standard are the result of a significant vetting process. If additional requirements, such as those identified above, are included in a local adoption, the resulting sprinkler systems installed would not be considered an NFPA 13D system. Yet without all the requirements of NFPA 13, such systems cannot be considered NFPA 13 compliant. More importantly, it would defeat the intent of a cost effective life safety sprinkler system. (California Fire Sprinkler Coalition (June 3, 2014). *Limit Local Amendments to Residential Sprinkler Requirements* [White Paper]. Retrieved September 31, from NFPA's Fire Sprinkler Initiative 2016: <https://www.friends.edu/wp-content/uploads/2015/08/ElectronicReference.pdf>)

Conclusion - Recommendations

The Working Group spent a significant amount of time discussing the three specific issues presented by the OSFM. The members of the Working Group agreed on the following recommendations to the State Fire Marshal:

- Detached garages that are converted to a dwelling require a residential fire sprinkler system. OSFM Code Interpretation 15-006 as well as the intent of the State Fire Marshal when the provisions were adopted into the 2010 California Residential Code is correct. Any change in use (occupancy) of an existing structure and any new detached structure would require residential fire sprinklers.
- Multipurpose systems are required to meet the 5 gpm from Section R313.3.5 of the CRC. The section needs to be amended to reflect how the 5 gpm should be added to multipurpose systems. For multipurpose piping systems, the 5 gpm (19 L/min) demand shall be added at the domestic connection nearest the design area. This demand may be split between two domestic connections at 2.5 gpm (10 L/min) each.
- Stand-alone pumps and tanks that only supply the fire sprinkler system are a viable option. Specific requirements would be required to allow a stand-alone pump. These requirements would ensure that the pump will function when a fire event occurs.
- Local enforcing agencies should strongly consider if local amendments are truly needed and justifiable for NFPA 13D systems. Those that are absolutely necessary should be based upon specific local conditions relative to climatic, topographical, geological or resource constraints (access and water supply always being a consideration).
- The OSFM should re-form a stakeholder meeting that would include fire service, water purveyors, industry and other interested stakeholders to discuss the on-going meter cost and backflow requirements.
- The OSFM should revise and re-issue the informational bulletin titled Residential Automatic Fire Sprinklers in One and Two-Family Dwellings and Townhouses. This bulletin was originally issued on February 18, 2010.

Appendix A- Code Interpretation 15-006



California State Fire Marshal CODE INTERPRETATION

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|-----------------|---|----------------|--------|
| Date Issued | December 3, 2015 | Interpretation | 15-006 |
| Topic | Garage Conversions to Dwellings Units and Residential Fire Sprinkler Requirements | | |
| Code Section(s) | CRC Section R313.2 | | |
| Requested by | Randall Metz, Fire Marshal Carlsbad Fire Department | | |
| Date Received | November 16, 2015 | | |

Question 1: Is it the intent of the exception listed under California Residential Code (CRC) Section R313.2 to apply to the existing one- and two-family dwelling on the property or does it extend to alternations/additions to other detached structures anywhere on the property?

Question 2: Was it the intent of the CRC Section R313.2 to require residential fire sprinklers in new second dwelling units in the following scenarios?

Example A: A new dwelling unit is added to the existing detached garage (or other existing detached accessory structures).

Example B: An existing detached garage (or other existing detached accessory structure) is converted to a new dwelling unit.

Example C: An existing detached garage (or other existing detached accessory structure) is converted to a new dwelling unit and additional floor area is added for the new unit.

Answer: The State Fire Marshal's adoption of and intent of the exception to CRC Section R313.2 is to apply only to existing one- and two-family dwelling buildings located on the property that are undergoing an addition or alteration. The exception does not apply to other detached structures located on the property that are adding or converting into a new dwelling unit that is detached from the existing dwelling unit on the property.

Detached garages and accessory structures (typically Group U Occupancies) are not considered a one- or two-family dwelling (Group R-3 Occupancy). Detached garages and other detached accessory structure are made to comply with the California Building Code (CBC) when a change in use is made in accordance with CRC Section R110.2, this section further references CBC Section 3408. The CBC Section 3408 states "No change shall be made in the use or occupancy of any building... unless such structure is made to comply with the requirements of this code." When a detached garage or accessory structure are converted to a one- or two-family dwelling it is considered a change of occupancy, and the new occupancy must comply with the current codes. Therefore, residential fire sprinklers would be required in all detached garages and accessory structures converted to a one- and two-family dwelling.

Background and Intent of Automatic Fire Sprinkler Systems for One- and Two-Family Dwellings as adopted and amended by the Office of the State Fire Marshal

In October 2008 and again in April 2009 the Office of the State Fire Marshal convened representatives from various disciplines to study issues concerning the water supply of residential sprinklers and the installation of residential sprinklers. The purpose of the two task groups was to provide information, recommendations, and suggested strategies for solutions to the State Fire Marshal. This was in preparation for a statewide residential fire sprinkler requirement for new construction scheduled for implementation January 1, 2011.

Reasons supporting residential sprinkler were numerous. They included:

- Vulnerable and special need populations are growing and require higher levels of protection than we commonly think of with able-bodied, English-speaking adults.
- Sprinkler fire protection systems are the best, first defense against life and property loss but are not infallible. Layered fire protection is the appropriate risk mitigation approach.
- Our life loss history in California continues to need improvement. Too many people still die in preventable, mitigable fires.
- Firefighter safety is important. More firefighters are injured or die in residential fires than any other occupancy.
- The State Fire Marshal is charged with setting the fire and panic standards for California and has done so with an open, participative, researched and professional process for this adoption.
- The impact of our amendments is not far-reaching or overly restrictive. They are reasonable, focused, limited to those buildings with the greatest risk of life loss, and economically neutral.

The adoption of residential automatic fire sprinkler systems was approved by the Building Standards Commission (BSC) on January 12, 2010 (with an effective date of January 1, 2011). This provision required residential sprinklers in all new one- and two-family dwellings.

Appendix B- Information Bulletin



California State Fire Marshal Information Bulletin

Residential Automatic Fire Sprinklers in One- and Two-Family Dwellings and Townhouses

Issued: 2/18/10

This Information Bulletin is to clarify which provisions have been adopted and/or amended by the SFM regarding residential automatic fire sprinkler systems in one- and two-family dwellings and townhouses for statewide application. The adoption of residential automatic fire sprinkler systems was approved by the Building Standards Commission (BSC) on January 12, 2010 (with an effective date of January 1, 2011); and since that time, the SFM has received inquiries primarily in regards to the following issues:

- a.) The use of a domestic shutoff valves; and
- b.) The need for an acceptable water supply source

The SFM has adopted through the BSC the 2009 International Residential Code (IRC) by reference for inclusion into 2010 California Residential Code (CRC) as part of the California Building Standards Code (Title 24, CCR, Part 2.5). This adoption includes provisions for the installation of automatic fire sprinkler systems for new one- and two-family dwellings and townhouses by one of several methods, that include but are not limited to provisions contained in 2010 CRC, Section R313.3 (derived from Section P2904 of the 2009 IRC) or the National Fire Protection Associations (NFPA-13D, 2010 edition) Standard for the Installation of Sprinkler Systems in One- and Two-family Dwellings and Manufactured Homes.

The adoption of these provisions and/or standards allows for the installation of a domestic shutoff valve with a single water supply source/metering. The SFM has not adopted a standard or code that would "require" a second (dual) water supply source/metering (domestic demand and fire protection demand). Furthermore, the "preferred method" in accordance with NFPA-13D (2010 edition) is a single meter with domestic shut off as described in the NFPA 13D Annex A Explanatory Material for section 6.2. However, it must be emphasized that the size of and/or the requirement for a second water supply source/metering is subject to the acceptance of the local water purvey, city or county or city and county or the local fire authority having jurisdiction.



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Note: *The design of the Domestic Shutoff Valve is such that if there is a fire sprinkler operation/activation during domestic usage, the Valve will automatically shut off flow to the domestic system and divert the available water supply to the fire sprinkler system, thereby eliminating the lower flow into the sprinkler system that might otherwise be caused by possible significant domestic water usage. The use of a domestic valve can eliminate the need to combine the domestic and sprinkler demand (gallons per minute) when performing the hydraulic design calculation, thus enhancing the water meter/pipe sizing in many cases.*

The SFM convened a group of Subject Matter Experts to address the residential fire sprinkler/water supply issues. Between October 9, 2008 and March 30, 2009 this group developed the SFM Residential Fire Sprinkler/Water Purveyor Task Force (Phase I) Final Report with recommendations for “best practices” which was issued in June 2009. This report is available for review and downloading (PDF) at:

<http://osfm.fire.ca.gov/pdf/firemarshal/taskforcefinalreport.pdf>

Additionally, a copy of the SFM Residential Fire Sprinkler Installation Task Force (Phase II) Final Report with recommendations for “best practices” was issued in June 2009 and is available for review and downloading (PDF) at:

<http://osfm.fire.ca.gov/pdf/firemarshal/taskforcephast2finalreport.pdf>

A third report, the SFM Residential Fire Sprinkler Training and Education Task Force (Phase III) Final Report with recommendations is being finalized and will be available soon for review and downloading (PDF)

For more information please visit our website <http://osfm.fire.ca.gov>